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National Institute of
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DBT - AIST International Laboratory for Advanced Biomedicine

DAILAB

Classroom for Advanced & Frontier Education

CAFE

DAILAB-CAFE

Series - 12

Date and Time – Oct. 7, 2015 (12:30~13:30)
Venue - Central 4 (2F) Meeting Room 1

Speaker – Tomohiro TAMURA
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Title – Efficient production of active form of vitamin D_3 by microbial conversion

Vitamin D_3 (VD_3) is a fat-soluble prohormone that plays a crucial role in bone metabolism, immunity, and the control of cell proliferation and differentiation. The most active form, $1\alpha,25(OH)_2VD_3$, is used to treat osteoporosis, hyperparathyroidism, psoriasis, and VD_3 metabolic abnormality. The industrial production of $1\alpha,25(OH)_2VD_3$ is performed chemically or microbiologically, but the processes for the microbiological production of the active form of VD_3 are simpler than those for chemical synthesis.

The actinomycete *Pseudonocardia autotrophica* is capable of bioconversion of VD_3 into its physiologically active forms, $25(OH)VD_3$ or $1\alpha,25(OH)_2VD_3$. We identified vitamin D_3 hydroxylase (vdh) from *P. autotrophica* and characterized it structurally and enzymatically. Biotransformation of VD_3 into $25(OH)VD_3$ was then accomplished with a Vdh-expressed recombinant strain of actinomycete *Rhodococcus erythropolis*. We have recently succeeded in significant improvement of cellular permeability of vitamin D3 by using nisin-treated cells, and have developed a new platform for vitamin D_3 hydroxylation process.

In this seminar, I would like to introduce how to improve the efficiency of production of hydroxylated form of vitamin D3 by using *Rhodococcus erythropolis* as a host cell.